REMARKS/ARGUMENTS

Claims 1, 4-5, 12, 16 and 20-22 are currently pending in the present patent application, with claims 2, 3, 6-11, 13-15 and 17-19 having been withdrawn by the Examiner. In an Office Action mailed October 28, 2005, the Examiner indicates that claims 1-19 were originally pending even though claims 1-22 form all original claims submitted in the application. Also note Office Action indicates claims 1, 3, 4, 12, 16, and 20-22 are rejected, which erroneously omits claim 5 and includes withdrawn claim 3. Claims 1, 4-5, 12, 16 and 20-22 are currently pending and are considered rejected in this response. Amended Figures 1-4 accompany this amendment and include labels identifying each of them as Background Art.

In the Office Action, the Examiner rejected claims 1, 4, 5, 12, 16, and 20-22 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,724,039 to Blanchard ("Blanchard"). These claims were alternatively rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,823,172 to Mihara ("Mihara").

Amended claim 1 recites, in part, an insulated gate planar power device including a trench and body region as recited. The trench has a greater depth than the bottom of the source region and sufficient to expose at the bottom of the trench the drain region in the semiconductor bordered by the body region at least along two opposite sides. The depth of the trench is also less than a depth of the body region. The device of claim 1 further includes a polysilicon gate electrode that is insulated from the underlying semiconductor by a dielectric gate layer and is insulated from a source contact through a first dielectric layer formed on a top surface of the polysilicon gate. The polysilicon gate electrode is insulated laterally from the source contact through a dielectric spacer. Each of the first dielectric layer and dielectric spacer has a thickness that is independent of diffusion conditions of a body region and a doping level of the polysilicon gate.

Neither Blanchard nor Mihara discloses the recited structure of amended claim 1. With regard to Blanchard, in Blanchard's structure as shown in Figure 3A, isolation of a gate polysilicon 72 from the source metal 86 is provided by an oxide layer 74 which is grown by converting the polysilicon during subsequent thermal processing. See, e.g., column 6, lines 18-24. The oxide layer 74 is inevitably thinned during etching necessary for removing an oxide layer104 that forms in the recesses 78 of silicon (see Figure 7). These oxide layers 74 and 104 are native oxides grown during the same thermal processing that diffuses dopants in regions

100 and 102. The layers 74 and 104 differ only because of the different dopant concentrations present in the two base materials and different crystallographic nature. The oxide grown on a heavily doped polysilicon has a thickness that may be double compared to the oxide grown on the doped monocrystalline silicon of the source region 82. Therefore, the final thickness of the oxide layer 74 over the polysilicon gate 72 is determined by the difference of doping between the two starting materials and can hardly exceed 100 nm, unless excessive thermal processing is used, which deform the gate and body structures and would not be compatible with the objective of realizing a submicron structures.

In contrast to the structure of Blanchard, claim 1 recites that each of the first dielectric layer and dielectric spacer has a thickness that is independent of diffusion conditions of a body region and a doping level of the polysilicon gate. This allows the thicknesses of the first dielectric layer and dielectric spacer to be chosen independent of the diffusion conditions of the body regions and the doping level of the polysilicon gate.

Turning now to Mihara, the trench and contact formed therein as shown in Figure 1 have a greater depth than the depths of the body regions 4 and even 5. In contrast, claim 1 expressly recites that the depth of the trench is less than a depth of the body region, which is not true of the structure in Mihara. Also note the comments with regard to the polysilicon gate, first dielectric layer, and dielectric spacer discussed above with regard to Blanchard apply to Mihara as well. The process of Mihara neither discloses nor suggests a first dielectric layer and separate spacer as recited in amended claim 1. The process of Mihara also results in the geometries of Mihara being larger that the submicron geometries obtainable with the present invention.

For these reasons, neither Blanchard nor Mihara discloses or suggests the combination of elements in claim 1 and this claim is accordingly allowable.

Amended claim 12 recites, in part, an insulated gate power device an aperture having a first depth extending beyond the surface of the drain region and having sidewalls defined by adjacent first and second gate stacks. The gate stacks each include a polysilicon gate layer that is electrically isolated from the aperture through a respective dielectric spacer. Each of a first and second body region has approximately a second depth that is greater than the first depth of the aperture. A metal region is formed in the aperture to the first depth. The metal region contacts

the body and source regions and the contact opening. The polysilicon layer in each gate stack is further insulated from the metal region through a first dielectric layer formed on a top surface of the polysilicon layer. The first dielectric layer and dielectric spacers have thicknesses that are independent of diffusion conditions of the body regions and doping profiles of the polysilicon gate layers.

Neither Blanchard nor Mihara discloses or suggests gate stacks each including a polysilicon gate layer that is electrically isolated from the aperture through a respective dielectric spacer and first dielectric layer where the first dielectric layer and dielectric spacers have thicknesses that are independent of diffusion conditions of the body regions and doping profiles of the polysilicon gate layers. The converse is true with the processes used and structures disclosed in Blanchard and Mihara. Accordingly, the combination of elements in amended claim 12 is allowable.

Independent claim 20 is allowable for reasons similar to those discussed with above with regard to claim 12. All dependent claims are allowable for at least the same reasons as the associated independent claim and due to the additional limitations added by each of these dependent claims.

The present patent application is in condition for allowance. Favorable consideration and a Notice of Allowance are respectfully requested. Should the Examiner have any further questions about the application, Applicant respectfully requests the Examiner to contact the undersigned attorney at (425) 455-5575 to resolve the matter. If any need for any fee in addition to that paid with this response is found, for any reason or at any point during the prosecution of this application, kindly consider this a petition therefore and charge any necessary fees to Deposit Account 07-1897.

Respectfully submitted,

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